REMARKS

Applicants traversed in the reply on January 10, 2005 that new claim 10 is a linking claim. However, the Examiner treated claim 10 as a claim that is withdrawn and subject to rejoinder under MPEP 821.04 in the Office Action on February 8, 2005. Further, the Examiner mentioned that any method claims of the same scope as any allowed articles claims will be rejoined upon allowance. Applicants believe that the scope of Group II and claim 10 are the same, and Group II claims are readable on claim 10. Accordingly, Applicants respectfully request that claims 5-9, i.e. Group II claims, be examined together when any articles claims are allowed.

Applicants have carefully reviewed the Examiner's Office Action, in which the Examiner rejected claims 1, 2 and 4 under 35 U.S.C. 102(b) as being anticipated by Johnson et al.(U.S. 6,278,049) and rejected claim 3 under 35 U.S.C. 103(a) as being unpatentable on the ground of obviousness over Johnson et al. (U.S. 6,278,049).

Amendments to the claims

Applicants have amended the claims in order to more particularly define the invention taking into consideration the outstanding Official Action.

Rejection of claims 1, 2 and 4 under 35 U.S.C. 102(b) as being anticipated by and claim 3 under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (U.S. 6,278,049)

According to the invention as defined in the claim 1, a multilayer RF module is manufactured, which includes a plurality of vertically stacked ceramic layers including a first to a third ceramic layers. Further, each of the first and the third ceramic layers has a circuit component thereon and the second ceramic layer is located between the first and the third ceramic layers and provided with at least one or more air cavities filled with air. Each of the air cavities is vertically aligned with the circuit components of the first and the third ceramic layers. The air cavity has low dielectric constant in the multilayer RF module. Accordingly, dielectric loss in transmission lines of RF module is markedly reduced. Further, the generation of parasitic capacitance in circuit

components, e.g., passive elements, is also significantly reduced, thereby improving the passive element properties such as self-resonance frequency and Q-factor.

In contrast, Johnson et al. disclose a thermoelectric device including outer layers with metallic circuit lines and intermediate layer with blinded vias. The intermediate layer has lower thermal conductivity than the outer layers. While the present invention relates to a multilayer RF module, Johnson et al. relate to a thermoelectric device for converting heat into electric current, or electric current into heat. Accordingly, in view of the field of the invention, Johnson et al. cannot be a proper prior art reference to vitiate the patentability of the present application.

Further, the Examiner assumed that the air cavity of the present invention corresponds to the via in Johnson et al. However, the via provides lower thermal conductivity across the length of the device, whereas the air cavity reduces dielectric loss in transmission lines of RF module. In view of the above, the function of the via is different from that of the air cavity. Accordingly, the via does not correspond to the air cavity as would be appreciated by one of ordinary skill in the art to which the invention pertains.

Further, Johnson et al. do not define the positional relation between the vias and metallic circuits. That is, Johnson et al. do not disclose that each of the vias is vertically aligned with the metallic circuits on the outer layers. Because the air cavities have an effect on the properties of the circuit components, e.g., dielectric loss in transmission lines or self-resonance frequency and Q-factor of passive elements, the positional relation therebetween is an important feature of the present invention.

Since Johnson et al. lacks the above positively recited feature of the presently claimed invention, and since there is no possible motivation to include the feature, it is respectfully submitted that the prior art references could have not suggested the claimed invention, and that the rejection under 35 USC 102(b) and 103(a) are therefore improper. Accordingly, it is most respectfully requested that these rejections be withdrawn.

Further, it is also believed that the claims 2-4, directly or indirectly depending on claim 1, are allowable for the same reasons indicated with respect to claim 1, and further because of the additional features recited therein which, when taken alone and/or in combination with the features recited in claims 2-4 remove the invention defined therein further from the disclosures made on the prior art reference.

Applicants believe that this is a full and complete response to the Office Action. For the reasons discussed above, Applicants now respectfully submit that all of the pending claims are in complete condition for allowance. Accordingly, it is respectfully requested that the Examiner's rejections be withdrawn; and that claims 1-4 be allowed in their present form.

Should the Examiner require or consider it advisable that the specification, claims an/or drawings be amended or corrected in formal respects, in order to place the case in condition for final allowance, then it is respectfully requested that such amendment or correction be carried out by Examiner's Amendment and the case be passed to issue.

Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing this case to allowance, the Examiner is invited to telephone the undersigned.

Respectfully submitted,
BACON & THOMAS, PLLC

By: Richard E. Fichter

Richard E. Fichter
Registration No. 26,382

625 Slaters Lane, 4th Fl.
Alexandria, Virginia 22314
Phone: (703) 683-0500
Facsimile: (703) 683-1080
REF:kdd
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May 9, 2005